

REMARKS

Review and reconsideration on the merits are requested.

Applicants assume that in this RCE the Examiner would rely on the same prior art as in the Action of July 20, 2007 in this application, namely Albrecht et al (Albrecht) and Melnik et al (Melnik).

Further, Applicants assume that the Examiner would take a position similar to that set forth in the Action of July 20, 2007, with respect to the prior art.

Applicants amend the claims at this time. They limit to the (braces are omitted) 20-24 diffraction plane and limit to a thickness of 200 μm or more. Limitation to the 20-24 diffraction plane simply represents claiming one of the species originally set forth in claim 1; the limitation to 200 μm or more finds basis at page 5, line 12 of the specification.

Assuming that the Examiner would pose an obviousness rejection over Albrecht in view of Melnik, Applicants would respectfully traverse based upon the remarks now set forth.

The Invention

The present invention provides the art, for the first time, a self-supported nitride semiconductor substrate which simultaneously meets the desire for a large size self-supported nitride semiconductor substrate, namely a thickness of 200 μm or more, and a diameter of 10 mm or more, but also which provides an X-ray diffraction half width of 500 seconds or less in a 20-24 diffraction plane. See the present specification at, for example, page 5, lines 6-12 and, for example, Example 6.

Thus, the claims of the present application contain important limitations on:

The fact that the nitride semiconductor substrate is self-supported.

The same has a recited, specific X-ray diffraction half width;

The same has a specific minimum diameter; and

The same has a specific minimum thickness.

It is respectfully submitted that the prior art, in combination, does not reasonably suggest (render obvious) a self-supported nitride semiconductor exhibiting the recited characteristics.

In contrast to the present invention, the Albrecht product is small, namely $7 \times 6 \times 0.1 \text{ mm}^3$ at the maximum. See page 454, lines 7-8 in Experimental of Albrecht. This is substantially smaller than the size claimed in the present application.

On the other hand, although Melnik describes a larger GaN crystal than Albrecht, the value of the X-ray diffraction half width in accordance with Melnik is evaluated by the half-width of an X-ray rocking curve in a [0002] diffraction plane, which corresponds to conventional technology. See col. 11, lines 32-35, of Melnik.

Albrecht contains no suggestion whatsoever that a large size self-supported nitride semiconductor substrate could or should show an X-ray diffraction half width of 500 seconds or less in a 20-24 diffraction plane, albeit Albrecht does mention the diffraction plane of the 11-24 plane.

Would one of ordinary skill in the art appreciate that the Albrecht material would inherently show any type of X-ray diffraction half width in a 20-24 diffraction plane? Further, would one of ordinary skill appreciate that such X-ray diffraction half width would be 500 seconds or less?

Applicants submit that since Albrecht is completely silent and contains no suggestion of the possibility or desirability of a substrate having a large size and exhibiting an X-ray diffraction half width as claimed, even in combination with Melnik and Albrecht would not render the claims here obvious to one of ordinary skill in the art.

There is nothing that would suggest, it is submitted, to one of ordinary skill in the art that **large size** self-supported nitride semiconductors as claimed in the present application having a specified half width in a 20-24 diffraction plane could be obtained.

At best, if one were to combine Albrecht in view of Melnik, one would know that one might be able to obtain an extremely small GaN crystal having a certain X-ray diffraction half width in an 11-24 plane, and it is possible to grow large GaN crystals which are not indicated to have any X-ray diffraction half width, but there is nothing that suggests it is possible to grow large GaN crystals as in the present invention having a defined X-ray diffraction half width of 500 seconds or less in the 20-24 plane.

The Examiner is requested to reconsider the rejection and allow all claims.

Substance of Interview Summary

A telephone interview was conducted concerning this application on November 30, 2007.

The only issue discussed was whether limiting to the 20-24 diffraction plane and a size of 200 μm or more would distinguish the combination of prior art relied upon by the Examiner.

The Examiner felt that a case of prima facie obviousness existed, and the only way to avoid the rejection would be to show that certain self-supported nitride semiconductor substrates

will have an X-ray diffraction half width as claimed but that these substrates would not show a X-ray diffraction half width of 500 seconds or less in a 11-24 diffraction plane.

The Examiner's position was basically one of inherency.

Applicants respectfully submit that the only teaching of record of any type of inherency between the 20-24 diffraction plane and the 11-24 diffraction plane comes from the present specification, i.e., there is no suggestion in the prior art that a GaN semiconductor substrate having a certain X-ray diffraction half width in an 11-24 diffraction plane would exhibit any diffraction within the 20-24 diffraction plane, and certainly not one as recited in the claims herein.

No other issues were discussed. The only claim discussed was claim 1. The prior art was not discussed in detail, no exhibits were shown, etc.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

AMENDMENT UNDER 37 C.F.R. § 1.114(c)
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SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE

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CUSTOMER NUMBER

Respectfully submitted,



/Peter D. Olexy/

Peter D. Olexy

Registration No. 24,513

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